The TMJ consists of three bony parts:

- Glenoid fossa—Oval depression in the temporal bone that articulates with the mandibular condyle.
- Articular eminence—Ramp-shaped segment of the temporal bone located anterior to the glenoid fossa.
- Condyle—The knuckle-shaped portion of the mandibular ramus found on the end of the condyloid process. It is positioned underneath the glenoid fossa and makes up the hinge joint of the TMJ.

MUSCLES OF THE HEAD

The muscles of the head can be classified into two groups, muscles of facial expression and muscles of mastication. How muscles work and function depends on the action of each muscle (movement), the type of joint it is associated with, and the way the muscle is attached on either side of the joint. Muscles are usually attached to two places: one end being joined to an immovable or fixed portion, and the other end being joined to a movable portion on the other side of a joint. The immovable portion is called the origin of the muscle, and the movable portion is called the insertion. When muscles of the head contract, the insertion end is pulled toward the origin.

MUSCLES OF FACIAL EXPRESSION

The muscles that are underneath the skin of the face are responsible for helping communicate our feelings through facial expression. The muscles of the mouth help us express surprise, sadness, anger, fear, and pain. Table 3-3 lists the muscles of facial expression and figure 3-15 illustrates these muscles.

MUSCLES OF MASTICATION

Mastication is defined as the process of chewing food in preparation for swallowing and digestion. Four pairs of muscles in the mandible make chewing movements possible. These muscles can be grouped into two different functions. The first group includes three pairs of muscles that elevate the mandible to close the mouth as in biting down. The last group includes one pair that can depress the mandible (open the mouth), make grinding actions side to side, and can make the mandible go forward in a protruding motion. Table 3-4 lists the muscles of mastication and figure 3-16 illustrates these muscles.

ORAL STRUCTURES OF THE MOUTH

The oral cavity (mouth) contains various structures that aid in the digestion process of food and also serves as an organ of speech and sensory

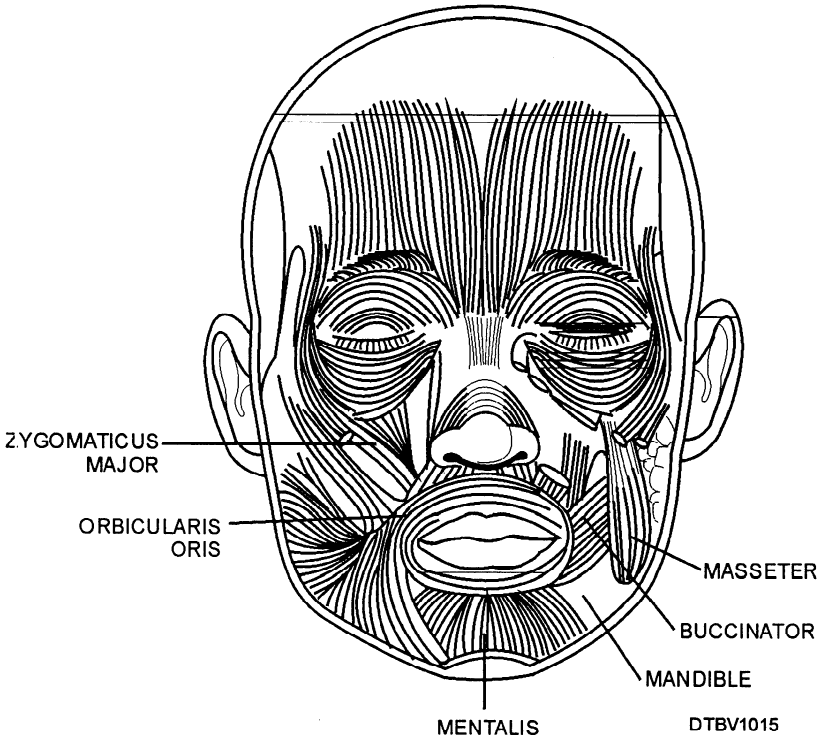

Figure 3-15.—Anatomy of muscles of facial expression.

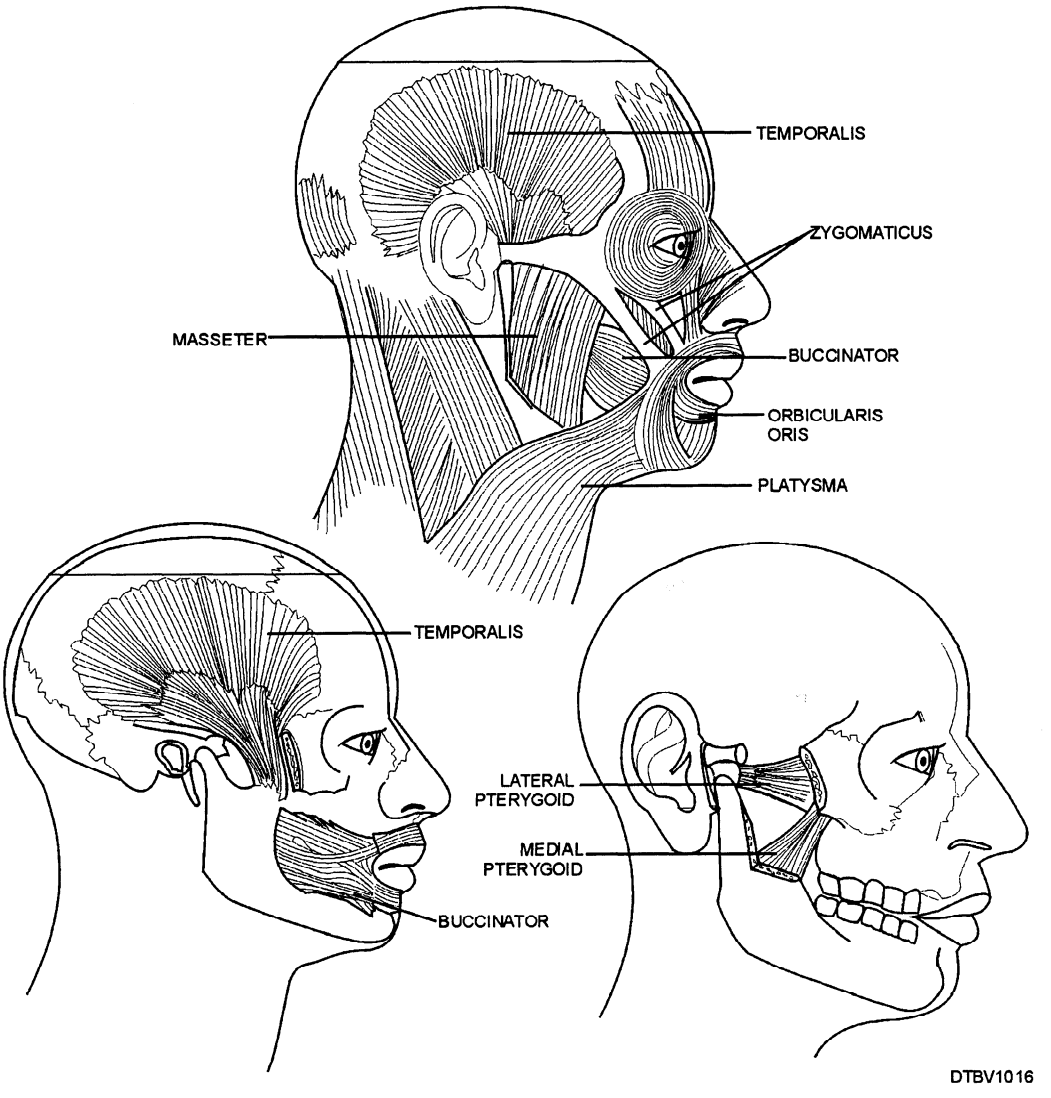

Figure 3-16.—Muscle anatomy of mastication.

Table 3-3.—Muscles of Facial Expression

Muscle	Origin	Insertion	Description
Orbicularis oris	Encircles the mouth (no attachement to bone)	Corners of the mouth	Located between the skin and mucous membranes of the lips. Makes lips close and pucker.
Buccinator	Alveolar process of maxilla and mandible	Orbicularis oris at the corner of the mouth	Located in the walls of the cheeks, holds food in contact with teeth when chewing, and assists in blowing air out of the mouth.
Mentalis	Mandible	Skin of chin	Raises and wrinkles the skin of the chin and decreases and protrudes the lower lip.
Zygomaticus Major	Zygomatic bone	Orbicularis oris (angle of the mouth)	Raises the corner of the mouth when smiling.

Table 3-4.—Muscles of Mastication

Muscle	Origin	Insertion	Description
Masseter	Zygomatic arch	Mandible (external surface)	Closes jaw; flat, thick muscle
Temporalis	Temporal bone	Coronoid process at the anterior border of the ramus	Closes jaw; fan-shaped
Medial pterygoid	Sphenoid, palatine, and maxillary bones	Inner (medial) surface of the ramus	Closes jaw; parallels masseter muscle
Lateral pterygoid	Sphenoid bone	Anterior surface of mandibular condyle	Opens jaw; allows grinding action side to side, and protrudes the mandible

reception. We receive food in the mouth, reducing it in size, and mixing it with saliva for the digestion process.

CHEEKS

The cheeks are the side walls of the mouth. They are made up of layers of skin, a moist inner lining called mucosa, fat tissue, and certain muscles. The buccinator muscle of the cheeks prevents food from escaping the chewing action of the teeth.

LIPS

The lips are covered externally by skin and internally by the same mucous membranes that line the oral cavity. They form the anterior border of the mouth. The area of the external lips where the red mucous membrane ends and normal outside skin of the face begins is known as the vermilion border. Figure 3-17 illustrates the anatomy of the lips.

The lips are very sensitive and act as sensory receptors, allowing food and liquids to be placed in the

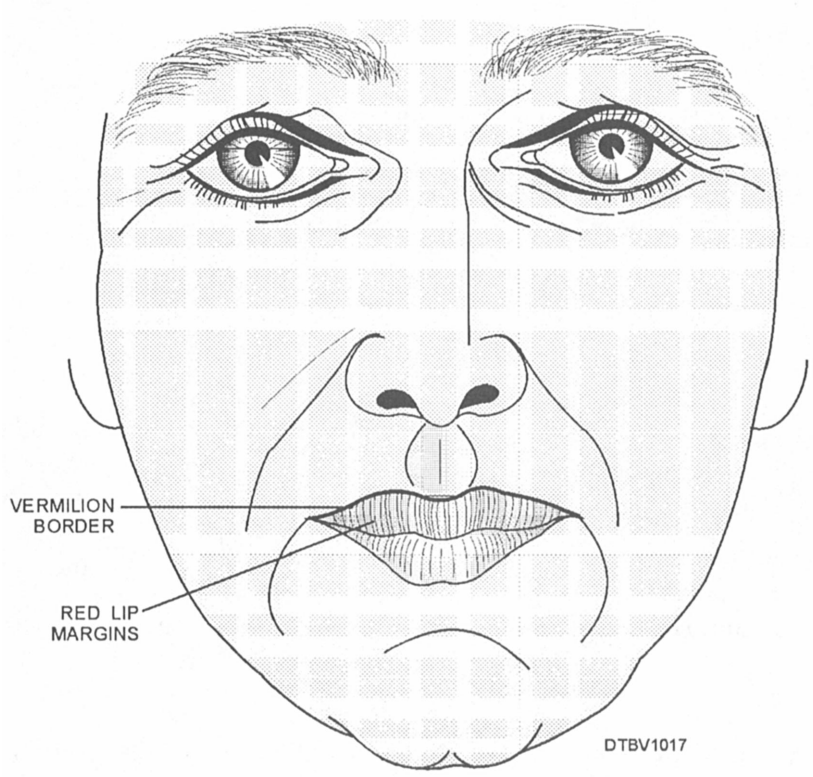

Figure 3-17.—Anatomy of the lips.

mouth but guarding the oral cavity against the ingestion of excessively hot or cold substances. They also provide a seal for the mouth to keep food and saliva from escaping. The lips help to maintain the position of the teeth and are very important in speech.

TONGUE

The tongue (fig. 3-18) is a vascular, thick solid mass of voluntary muscle surrounded by a mucous membrane (epithelium tissue). Located on the underneath side of the tongue is the lingual frenulum, which anchors the tongue in the midline to the floor of the mouth. The tip of the tongue is free moving and can readily change size, shape, and position.

Surface (Dorsal Aspect)

On the surface of the tongue are rough projections called papillae. They provide the tongue with friction in handling food and also act as taste buds.

Taste Buds

The four types of taste sensations are sweet, sour, bitter, and salty-all resulting from stimulation of the taste buds. Most are located on the tongue and the roof of the mouth. Figure 3-19 illustrates taste buds of the tongue.

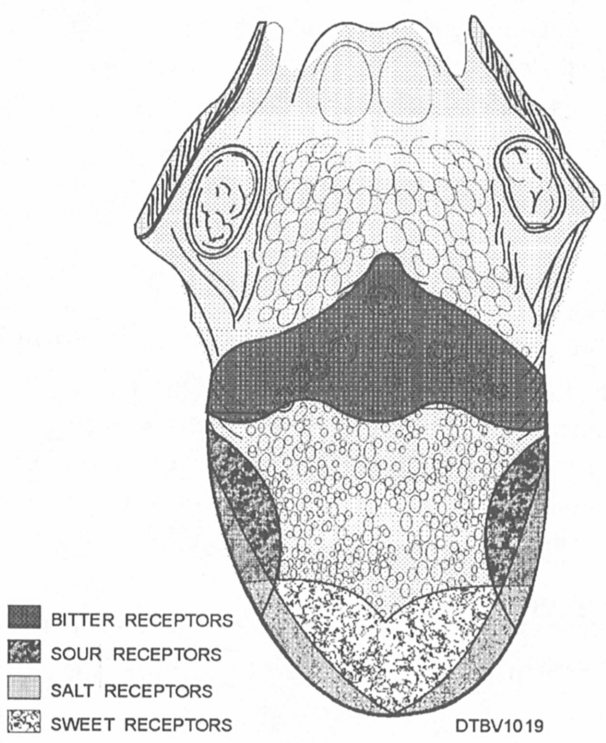

Figure 3-19.—Taste buds of the tongue.

Tongue and Digestion

The tongue is an important muscle in the chewing process. It crushes food against the palate; it deposits food between the chewing surfaces of the teeth for

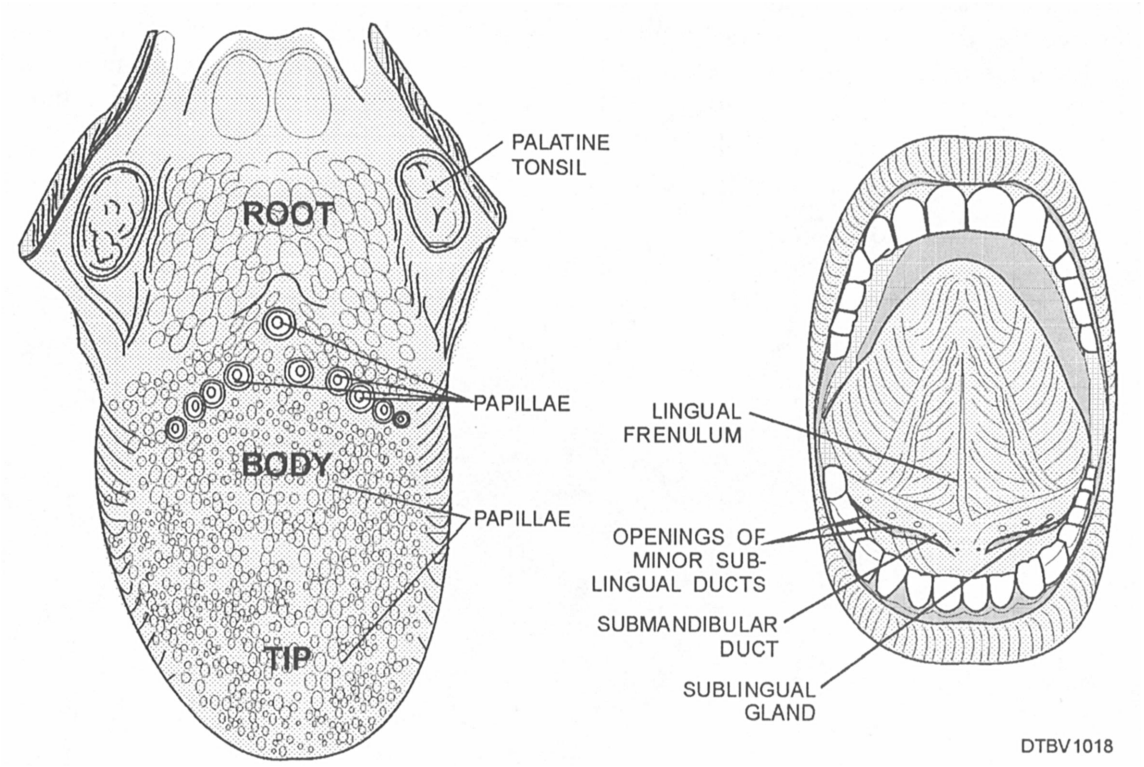

Figure 3-18.—Dorsal aspect of tongue (left), anatomy floor of mouth (right).

mastication; it transfers food from one area of the mouth to another; it mixes food with saliva, which assists in the digestive process; assists in swallowing; and cleans the mouth of residue.

MYLOHYOID AND GENIOHYOID

The mylohyoid muscles anatomically and functionally form the floor of the mouth (fig. 3-20). They elevate the tongue and depress the mandible. Their origin is the mandible and insertion is the upper border of the hyoid bone. The geniohyoid muscles are found next to each other, on each side of the midline, directly on top of the mylohyoid muscle. They have the same origin and function as the mylohyoid muscle.

PALATE

The palate (fig. 3-21) forms the roof of the mouth and is divided into two sections:

- Hard palate—This section is formed by the palatine process of the maxillary bones and is located in the anterior portion of the roof of the mouth. It has irregular ridges or folds behind the central incisors called rugae.

- Soft palate—This section forms a soft muscular arch in the posterior part of the palate. The uvula is located on the back portion of the soft palate. When you swallow, the uvula is drawn upward and backward by the muscles of the soft palate. This process blocks the opening between the nasal cavity and pharynx, not allowing food to enter the nasal cavity. The soft palate must function properly to allow good speech quality.

Located in the posterior part of the mouth, on both sides of the tongue, are two masses of lymphatic tissue called the palatine tonsils. They assist the body to protect against infections.

TEETH

The teeth are located in the alveolar process of the maxillae and the mandible. They serve important functions of tearing and masticating food, assisting in swallowing, speaking, and in appearance. The health of the teeth affects the health of the entire body.

SALIVARY GLANDS

The functions of the three major salivary glands are to keep the lining of our mouths moist, and to bond with food particles creating a lubricant effect that assists in the swallowing process of food. It acts as a cleaning agent to wash away food particles that accumulate in the mouth and on the teeth. Figure 3-22 illustrates the salivary glands.

The salivary glands produce two to three pints of saliva daily, which greatly aids in the digestion process.

Enzymes are present in saliva, they act on food, and start the breakdown process. In dentistry, knowing exactly where the saliva glands and ducts (openings) are located is important in keeping the mouth dry

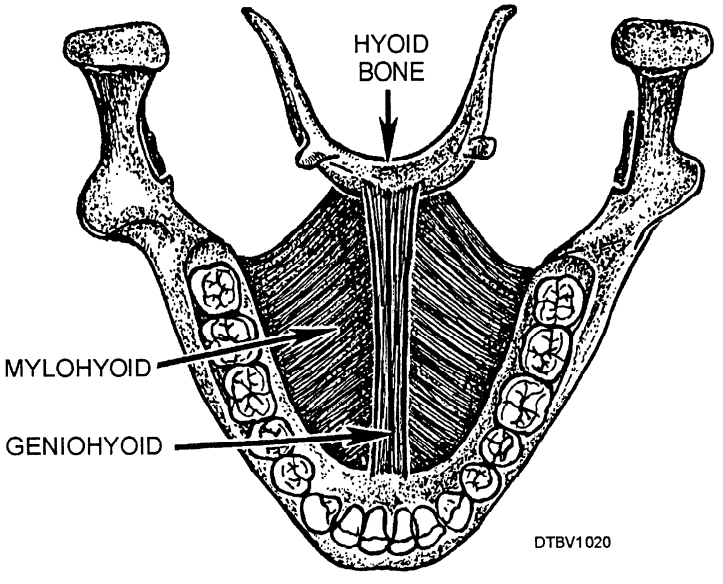

Figure 3-20.—Mylohyoid and geniohyoid muscles.

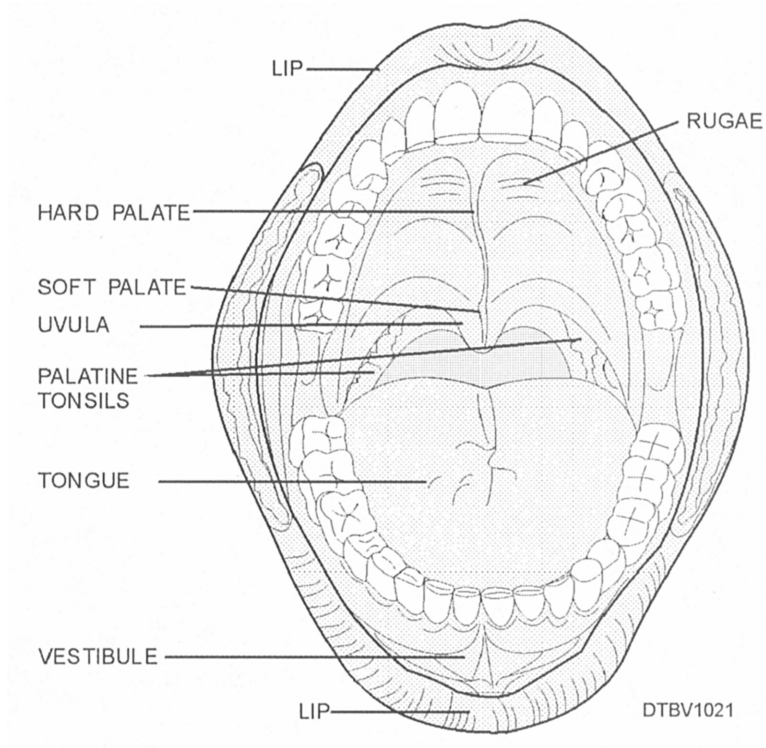

Figure 3-21.—Anatomy of the palate.

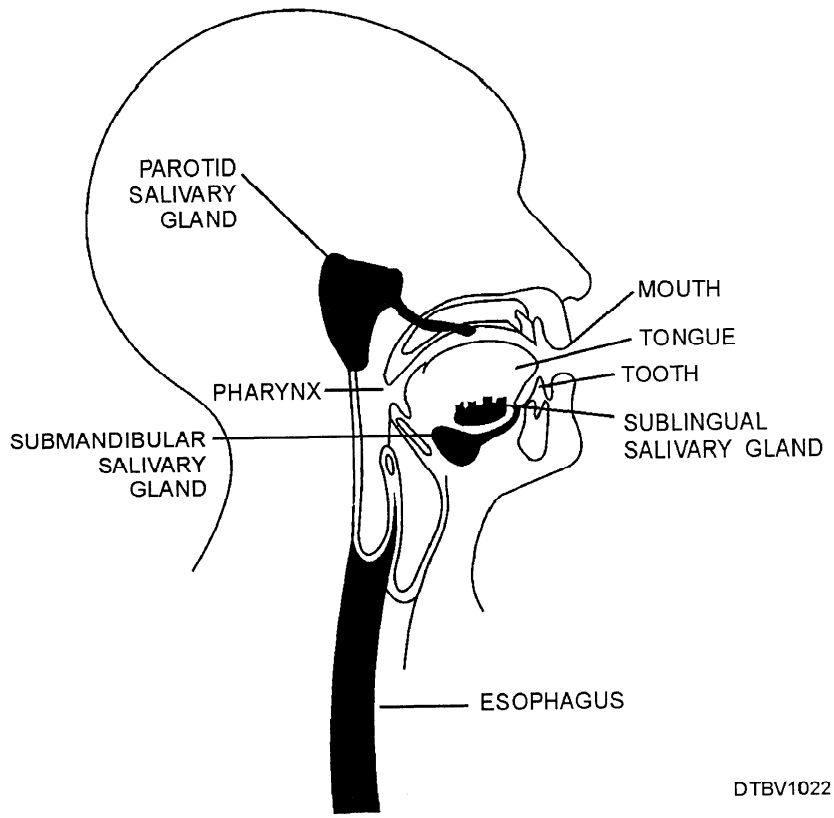

Figure 3-22.—Salivary glands.

during certain dental procedures. Table 3-5 lists the three major salivary glands.

MASTICATION AND DEGLUTITION

The mastication process includes the biting and tearing of food into manageable pieces. This usually involves using the incisors and cuspid teeth. The grinding of food is usually performed by the molars and premolars. During the mastication process, food is moistened and mixed with saliva.

Deglutition is the swallowing of food and involves a complex and coordinated process. It is divided into three phases; the first phase of swallowing is voluntarily; phases two and three are involuntary.

- Phase one: the collection and swallowing of masticated food.
- Phase two: passage of food through the pharynx into the beginning of the esophagus.
- Phase three: the passage of food into the stomach.

Table 3-5.—List of the Three Major Salivary Glands

Gland	Location	Duct	Description
Sublingual	On each side underneath the tongue, in the floor of the mouth	Multiple separate ducts	Smallest of salivary glands, secretes, thick stringy mucus.
Submandibular	Posterior portion of mandible, lingual to mandibular incisors	Opens under the tongue, close to the frenulum	Walnut sized. Secretes watery fluid with some mucus. More viscous (thick) than parotid secretion.
Parotid	Inside cheek, opposite maxillary second molar	Parotid ducts go through the buccinator muscles and enter the mouth opposite maxillary second molars	Largest of salivary glands. Secretes clear watery fluid.